

Amended Part of Specification

(Translation of substituted pages 2 and 3 of the Japanese specification,
corresponding to page 3, line 22 to page 6, line 15
of the English specification.)

5

OBJECT OF THE INVENTION

Accordingly, an object of the present invention is to provide a
castable refractory powder composition containing alumina cement capable
of providing a premixed material by tempering with water, which can keep
10 flowability for a long period of time.

Another object of the present invention is to provide a premixed
material containing alumina cement, which can keep flowability for a long
period of time.

A further object of the present invention is to provide a method for
15 casting such a premixed material comprising making it hardenable at room
temperature at the time of casting.

A still further object of the present invention is to provide a hardened
refractory body obtained by hardening such a premixed material at room
temperature.

20

DISCLOSURE OF THE INVENTION

As a result of intensive research in view of the above object, the
inventors have found that (a) the addition of a material for stopping the
hydration reaction of a powder composition containing alumina cement for
25 castable refractories (hereinafter referred to as "hydration stopper") provides
a premixed material, which would not be hardened at room temperature for
a necessary period of time even after tempering with water, and that (b) the
mixing of the above premixed material with a material for recovering

hydratability by breaking the hydration-stopping mechanism of alumina cement (hereinafter referred to as “hydration starter”) makes the premixed material hardenable at room temperature. The present invention has been completed based on these findings.

5 Thus, the castable refractory powder composition of the present invention, which is to be tempered with water to obtain a premixed material hardenable by adding a hydration starter, comprises refractory aggregate, fine refractory powder, alumina cement, a dispersing agent and a powdery hydration stopper for the alumina cement, the hydration stopper being a
10 material, which is acidic in a state of an aqueous solution, and the amount of the hydration stopper being controlled such that a premixed material has a pH of 2 to 7.

 The premixed material of the present invention is obtained by tempering a castable refractory powder composition comprising refractory
15 aggregate, fine refractory powder, alumina cement, a dispersing agent and a hydration stopper for the alumina cement with water in advance, the premixed material being hardened by adding a hydration starter, the hydration stopper being a material, which is acidic in a state of an aqueous solution, and the amount of the hydration stopper being controlled such that
20 the premixed material has a pH of 2 to 7.

 The method of the present invention for casting a premixed material comprises tempering a castable refractory powder composition comprising refractory aggregate, fine refractory powder, alumina cement, a dispersing agent and an alumina cement hydration stopper with water in advance to
25 prepare the premixed material, adding an alumina cement hydration starter to the premixed material and mixing them immediately before casting, and then casting the resultant mixture into a mold. It is preferable to use as the hydration stopper a material, which is acidic in a state of an aqueous

solution, the amount of the hydration stopper is preferably controlled such that the premixed material has a pH of 2 to 7, and the amount of the hydration starter is preferably 0.02 to 0.5% by mass (outer percentage), based on the total amount (100% by mass) of the refractory aggregate, the
5 fine refractory powder and the alumina cement.

The hardened refractory body of the present invention is obtained by adding an alumina cement hydration starter to the above premixed material and mixing them, and then casting the resultant mixture.

The hydration stopper used in the castable refractory powder
10 composition is preferably at least one selected from the group consisting of hydroxycarboxylic acids and their salts, a polyacrylic acid and its derivatives, salts of an acrylic acid, chelating agents, condensed phosphate, aluminum phosphate and a boric acid. When used in the premixed material, a phosphoric acid may be used as the hydration stopper in place of the above
15 compounds.

The alumina cement hydration starter added to the premixed material is preferably at least one selected from the group consisting of aluminates, hydroxides, carbonates, nitrites, silicates and borates of alkali metals, and oxides and hydroxides of alkaline earth metals.

20 In the casting method of the present invention, it is preferable to convey the premixed material through a pipe by the action of a pump, add the alumina cement hydration starter to the premixed material in the pipe and mix them by a line mixer connected to the pipe, and cast the resultant mixture from the outlet into the mold.

25 The storable days of the premixed material of the present invention after production (days during which the premixed material retains castable flowability) are 5 days or more, preferably 7 days or more. Accordingly, there may be 5 days or more, preferably 7 days or more from the production

of the premixed material to the addition of the hydration starter.